

## REMARKS

Reconsideration of the application is requested. Claim 9 was amended to address minor formalities. Similarly, the specification and the Abstract were amended to address minor formalities. No new matter was added. A new Abstract, page 16, is attached.

## OBJECTIONS

The Office Action objected to the Abstract on the grounds that a space should exist between the term "about" and "40%" in line 2 of the Abstract. In view of the modifications above, the objection is believed overcome. Reconsideration is requested.

The Office Action objected to the omission of the word "weight" on page 6, line 18 between "molecular" and "substances." In view of the modifications discussed above, the objection is believed overcome. Reconsideration is requested.

The Office Action objected to Claim 9, on the grounds that the word "of" was omitted between "copolymers" and "the aforementioned polymers." In view of the modifications above, the objection is believed overcome. Reconsideration is requested.

## REJECTION UNDER 35 USC 103

The Office Action rejected Claims 1-9 under 35 USC 103 over U.S. Pat. No. 5,378,268 (Wolf) in view of U.S. Pat. No. 4,578,406 (Volz) and U.S. Pat. No. 5,985,785 (Lane). The rejection should be withdrawn in view of the remarks below.

It is well-settled that to establish a *prima facie* case of obviousness, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *ProMold v. Great Lakes Plastics*, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill

in the art at the time the invention was made. *Amgen v. Chugai Pharmaceutical Co.* 18 USPQ 2d 1016, 1023 (Fed Cir, 1991), *cert. denied* 502 U.S. 856 (1991). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. *In re Wilson*, 165 USPQ 494, 496, (CCPA 1970). The Office Action did not establish a *prima facie* case of obviousness.

Applicant's invention relates to a primer comprising (a) from about 3 to about 40% by weight of a film or matrix former, (b) from about 0.1 to about 15% by weight of an additive having a molecular mass ranging from about 500 to about 20,000, (c) from about 0.1 to about 15% by weight of an ionic and/or colloidal metal or its organometallic covalent compound or its complex compound with organic ligands, (d) from about 0.5 to about 30% by weight of an organic and/or inorganic filler, (e) from about 0.05 to about 5% by weight of a hydrophilic swelling material comprising finely divided particles containing silanol groups and/or partly modified silanol groups having a diameter ranging from about 7 to about 40 nm and a specific surface area that ranges from about 50 to about 380 m<sup>2</sup>/g, and (f) from about 50 to about 90% by weight of organic solvents, in which all amounts by weight are based on the overall primer formulation. In one embodiment of Applicant's invention, Applicant's invention relates to a metallizable substrate comprising (a) a substrate and (b) Applicant's primer. In another embodiment, Applicant's invention relates to a metallized substrate comprising the reaction product of (a) a substrate and (b) a primer.

It was an object of Applicant's invention to provide a primer for electroless metallization that provides outstanding adhesion of the metal being electrolessly deposited to the primer even if low bath loadings are employed (See Specification, page 2, lines 20-22). An advantageous feature of the primer encompassed by Applicant's invention is the presence of from about 0.05 to about 5% by weight of a hydrophilic swelling material having certain characteristics. When treated with a primer according to Applicant's invention before metallization, a metallized plastic plate displays a surprisingly good adhesion of the deposited metal to the primer (See Examples 1, 3-5). By contrast, when the primer does not comprise the hydrophilic swelling material, adhesion is much worse (See Example 2).

Wolf teaches a primer consisting of (a) a film former or matrix former, (b) an additive having an overall surface tension in the range of 45-65 mN/m, (c) an ionic and/or colloidal noble metal or organometallic covalent compounds or complex compounds with this metal, d) a filler and e) a solvent (See Summary). A principal object of Wolf was to develop a process for chemical metallization, in which material surfaces based on glasses, metals and especially plastics can, without previous etching with oxidants, be provided with a well adhering metal coating deposited by wet-chemical means (See Summary). Wolf teaches that this object is achieved by coating substrate surfaces with a special primer based on a polymer organic film former or matrix former, which additionally also contains an additive (See Summary).

One of ordinary skill in the art following the teachings of Wolf would not have been motivated to modify Wolf, make Applicant's invention, and expect the results Applicant has obtained. Wolf teaches a primer without any hydrophilic swelling material. Further, Wolf teaches that a swelling adhesion treatment is disadvantageous because it might result in formation of stress cracks (See Column 4, lines 64-68). In fact, Wolf teaches using primers and that a swelling adhesion treatment of the plastic "is not necessary." Wolf teaches that avoidance of a swelling adhesion treatment is an advantage, because "the formation of stress cracks is avoided."

Such teachings would not have made one of ordinary skill in the art modify Wolf, use from about 0.05 to about 5% by weight of a hydrophilic swelling material, and expect the benefits Applicant has achieved. Such teachings would not have made one of ordinary skill in the art expect that the metallized plastics plate displays a surprisingly good adhesion of the deposited metal to the primer when a metallized plastic plate is treated with a primer according to Applicant's invention before metallization. Reconsideration is requested.

Volz and Lane do not overcome the deficiencies of Wolf. The differences between Wolf and Applicant's invention are fundamental and neither Volz nor Lane, singly or in combination, would have motivated one of ordinary skill in the art following Wolf to modify Wolf, make Applicant's invention, and expect the results Applicant's have obtained. In fact, one of ordinary skill would not have combined

Wolf, Volz, and Lane as alleged in the Office Action. Regardless, Applicant explains how Volz and Lane fail as secondary and tertiary references.

Volz teaches a process for post-treating polyurethane foam that was intended to impart desired properties and the modified foam formed (See Summary). The Volz post-treatment process involves (i) contacting polyurethane foam with a swelling agent for the polymer, (ii) interpenetrating the swollen foam with a chemical additive selected to impart desired properties to the foam, and (iii) shrinking the interpenetrated foam by removing the swelling agent under conditions where the chemical additive remains trapped in the polymeric structure of the foam (See Summary).

Volz would not been motivated to modify Wolf, make Applicant's invention, and expect the results Applicant has obtained. Volz addressed the problem of increasing the conductivity of a polyurethane foam. Volz would have encouraged one of ordinary skill in the art to (i) contact the polyurethane foam with a swelling agent for the polymer, (ii) interpenetrate the swollen foam with a chemical additive selected to impart desired properties to the foam, and (iii) shrink the interpenetrated foam by removing the swelling agent under conditions where the chemical additive remains trapped in the polymeric structure of the foam. Combining Volz with Wolf, the artisan would refrain from using a swelling adhesion treatment, as Wolf advises, and would recognize that avoiding a swelling adhesion treatment is advantageous, because stress cracks would be avoided--as Wolf teaches. Combining Volz with Lane, one of ordinary skill in the art following Wolf would not been motivated to make Applicant's invention. One of ordinary skill in the art would not have had any motivation to modify the primer disclosed by Wolf by adding a swelling material to improve adhesion. Reconsideration is requested.

One of ordinary skill in the art would have recognized that Volz teaches using a swelling agent to swell a polyurethane foam which can after this treatment easily interpenetrated by a chemical additive. The artisan would have recognized that the swelling agent of Volz has to be easily removable from the foam (column 3, lines 1-2) and is a hydrocarbon, ketone, aldehyde, alcohol, ester or ether (column 3, lines 5-9), i.e., is a solvent which functions to swell the polyurethane foam and does not

swell itself. By contrast, Applicant's invention encompasses a swelling material comprising finely divided particles containing silanol groups and/or partly modified silanol groups. The swelling material swells itself upon addition of an aqueous solution and remains in the primer. In other words, Volz would not have provided one of ordinary skill in the art any meaningful guidelines or details that would have led to the modification of Wolf into Applicant's invention. Reconsideration is requested.

It is noteworthy that Volz addressed the problem of increasing the conductivity of a polyurethane foam and is completely silent about the problem addressed by the present invention. Volz's silence about the problem addressed by Applicant's invention would not have provided the requisite motivation required by 35 USC 103. One of ordinary skill in the art would not learn from Volz how to solve the problem of good adhesion of a metal to a primer. Reconsideration is requested.

Lane teaches a method for making a laminate that is catalytically effective for subsequent electroless deposition of metals and that is useful as a substrate for printed circuit boards (See Abstract). Lane intended its method to provide an improved laminate having a substantially uniform distribution of finely divided catalytic metal,  $Me_{(0)}$ , within a crosslinked synthetic polymer impregnant (See Abstract). Lane teaches forming a catalytic metal-polymer complex between a salt of a catalytic metal and a crosslinkable synthetic polymer, providing a concentrate that may be worked up into an impregnating composition for impregnating reinforcing material. Lane teaches destroying the complex and reducing the catalytic metal to its elemental metal during or after crosslinking of the polymer system under conditions effective for crosslinking the polymer system.

Lane, as Wolf, does not bridge the gaps that separate Applicant's invention and the combined teachings of Wolf, Volz, and Lane. Lane's method for making a laminate, combined with Volz's post-treatment process, and Wolf's primer, would not have made one of ordinary skill in the art modify Wolf make a primer comprising (a) a film or matrix former, (b) an additive having a molecular mass ranging from about 500 to about 20,000, (c) an ionic and/or colloidal metal or its organometallic covalent compound or its complex compound with organic ligands, (d) an organic and/or

inorganic filler, (e) a hydrophilic swelling material comprising finely divided particles containing silanol groups and/or partly modified silanol groups, and (f) organic solvents, as claimed by Applicant. The combined teachings of Wolf, Volz, and Lane would not have made one of ordinary skill in the art modify Wolf, use from about 0.05 to about 5% by weight of a hydrophilic swelling material, and expect the benefits Applicant has achieved. The combined teachings of Wolf, Volz, and Lane would not have made one of ordinary skill in the art expect that the metallized plastics plate displays a surprisingly good adhesion of the deposited metal to the primer when a metallized plastic plate is treated with a primer according to Applicant's invention before metallization. Reconsideration is requested.

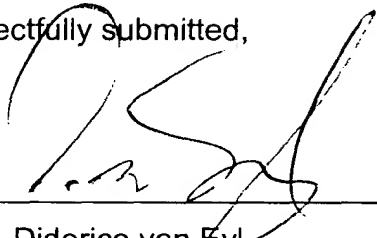
The Office Action's discussion about how Applicant's invention is allegedly obvious in view of Wolf, Volz, and Lane does not appreciate the differences that exist between Applicant's invention and the cited documents. Wolf, Volz, and Lane do not bridge the gaps that separate Applicant's invention and Wolf, Volz, and Lane. Wolf, Volz, and Lane would not have made one of ordinary skill in the art modify Wolf make the primer encompassed by Applicant's invention.

In summary, Wolf, singly or in combination with Volz and Lane, would not have made one of ordinary skill in the art following Wolf to modify Wold, make Applicant's invention, and expect the results Applicant has achieved. None of these documents teach Applicants' invention. Wolf, Volz, and Lane addressed problems that are completely different from the problem addressed by Applicants' invention, such that one of ordinary skill in the art following the combined teachings of these references would not have been motivated to modify Wolf and make Applicants' invention. Volz does not render obvious to use the swelling material defined in the present application as a component of a primer, let alone that this would result in a surprisingly superior adhesion. There is no hint in Volz to modify a primer for metallizing substrate surfaces by adding a swelling material to improve adhesion. Reconsideration is requested.

In view of the modifications and remarks above, a Notice of Allowance is earnestly requested.

Respectfully submitted,

By



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## MARKED UP VERSION OF MODIFICATIONS MADE

### IN THE CLAIMS

9. (Amended) The metallized substrate of Claim 5, wherein the substrate is selected from the group consisting of acrylonitrile-butadiene-styrene polymers, polycarbonates, polyamides, polyesters, polyvinyl chloride, polyethylene, polypropylene, polyphenylene sulphide, polyphenylene oxide, polyurethanes, polyimides, polyamideimides, polyetherimide, polysulphones, polyacetals, polystyrenes, thermosets, blends of the aforementioned polymers, and copolymers of the aforementioned polymers.

### IN THE SPECIFICATION

On page 6, the third full paragraph was modified to read as follows:

--Especially in the case of ABS, low molecular weight substances may pass from the ABS substrate into the primer. As a result, relatively large – colloidal – copper complexes are unable to penetrate the primer at low bath loadings in the case of primers in accordance with EP-A 485 839. Through the addition of the strongly hydrophilic swelling substance, the primer is able to swell and relatively large – colloidal – copper complexes are able to penetrate into the primer.--

### IN THE ABSTRACT

The Abstract was amended to read as follows:

#### -- PRIMER FOR METALLIZING SUBSTRATE SURFACES

#### ABSTRACT OF THE DISCLOSURE

A primer for the metallization of substrate surfaces by chemical reduction, comprising a) from about 3 to about 40% by weight of a film or matrix former, b) from about 0.1 to about 15% by weight of an additive having a molecular mass of 500 to 20,000, c) from about 0.1 to about 15% by weight of an ionic and/or colloidal metal or its organometallic covalent compound or complex compound with organic



ligands, d) from about 0.5 to about 30% by weight of an organic and/or inorganic filler, e) from about 0.05 to about 5% by weight of a hydrophilic swelling material comprising finely divided particles containing silanol groups and/or partly modified silanol groups having a diameter of from 7 to 40 nm and a specific surface area of 50 to 380 m<sup>2</sup>/g, and f) from about 50 to about 90% by weight of organic solvents, in which all amounts by weight being based on the overall primer formulation, offers advantages at low bath loadings.--

## PRIMER FOR METALLIZING SUBSTRATE SURFACES

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A primer for the metallization of substrate surfaces by chemical reduction, comprising a) from about 3 to about 40% by weight of a film or matrix former, b) from about 0.1 to about 15% by weight of an additive having a molecular mass of 500 to 20,000, c) from about 0.1 to about 15% by weight of an ionic and/or colloidal metal or its organometallic covalent compound or complex compound with organic ligands, d) from about 0.5 to about 30% by weight of an organic and/or inorganic filler, e) from about 0.05 to about 5% by weight of a hydrophilic swelling material comprising finely divided particles containing silanol groups and/or partly modified silanol groups having a diameter of from 7 to 40 nm and a specific surface area of 50 to 380 m<sup>2</sup>/g, and f) from about 50 to about 90% by weight of organic solvents, in which all amounts by weight being based on the overall primer formulation, offers advantages at low bath loadings.